



MINOS

# All Experimenter's Meeting

## NuMI Target Situation/Status

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 1

### **Update on the NuMI Target (Monday April 4, 2005):**

- 1) There is a water leak from the target RAW (radioactive water) cooling system into the Target Vacuum space. This developed around March 23rd. Target scans with low power beam read out with the Hadron Monitor at the absorber confirm this. Leak rate measurements were made to determine the size of the "hole."**
- 2) The entire volume of the target vacuum space was filled with water.**
- 3) Attempts to pump the water out through the vacuum port after turning off the RAW water supply were unsuccessful.**
- 4) Over-pressurizing the vacuum space with Helium was able to drive some water back through the hole into the (now empty) water lines.**
- 5) Low power target scans show that water (to about the vertical halfway point on the target) has been forced out.**



MINOS

# All Experimenter's Meeting

## NuMI Target Situation/Status(2)

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 2

- 6) Over the weekend, it became evident that even with a modest tipping of the target assembly we were unable to remove more water - we had reached the level of the hole and substantial water remained in the target snout below the present level of the water. We cannot run at high enough proton intensity to be useful with water surrounding the target graphite.**
- 7) It is now the plan, starting tomorrow, Tuesday April 5th, to pull the target assembly from the target chase and move it to the work cell.**
- 8) We do not know at present the exact level of activation of the target assembly. A crude measurement was made by dropping a probe through a survey port. As we carefully take things apart we will monitor the radiation levels, and the activation as found will have a controlling influence on the amount of work and investigation, and at what distances, is possible.**
- 9) It is hoped that we will be able to drain the target assembly, even if it must be done "at a distance", for radiation considerations.**



MINOS

# All Experimenter's Meeting

## NuMI Target Situation/Status(3)

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 3

- 10) A bench test of a "back pressurizing" design where we will run with slightly over pressured Helium in the "Vacuum" space to keep the water from coming out the "hole" has been successful - i.e. we should be able to contain the leak by keeping the Helium pressure higher than the cooling RAW water pressure. (IF WE CAN DRY OUT THE TARGET)**
- 11) A "stop leak" material is available from England that has been used successfully in reactors. We are investigating this in parallel.**
- 12) We are investigating a stopgap "somewhat lower energy" (i.e. lower intensity of protons on target) air-cooled target design. This is a NEW design and would take many weeks minimally.**
- 13) The assembly of the "spare" target is being pushed: July is the most likely projection.**



MINOS

# All Experimenter's Meeting

## NuMI Target Situation/Status(4)

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 4

**14) The "round trip" for removal, draining, inspection, etc., of the leaking target is minimally two weeks. This does NOT include the actual repairs (if possible), inspection (if possible), and testing time.**

**15) We are beginning the ordering of additional spare target materials for the existing design. There is a 9 months delivery for some of the items.**

**16) Running the existing target after draining, if possible, is highly desirable to look for the next weakest link in the design.**

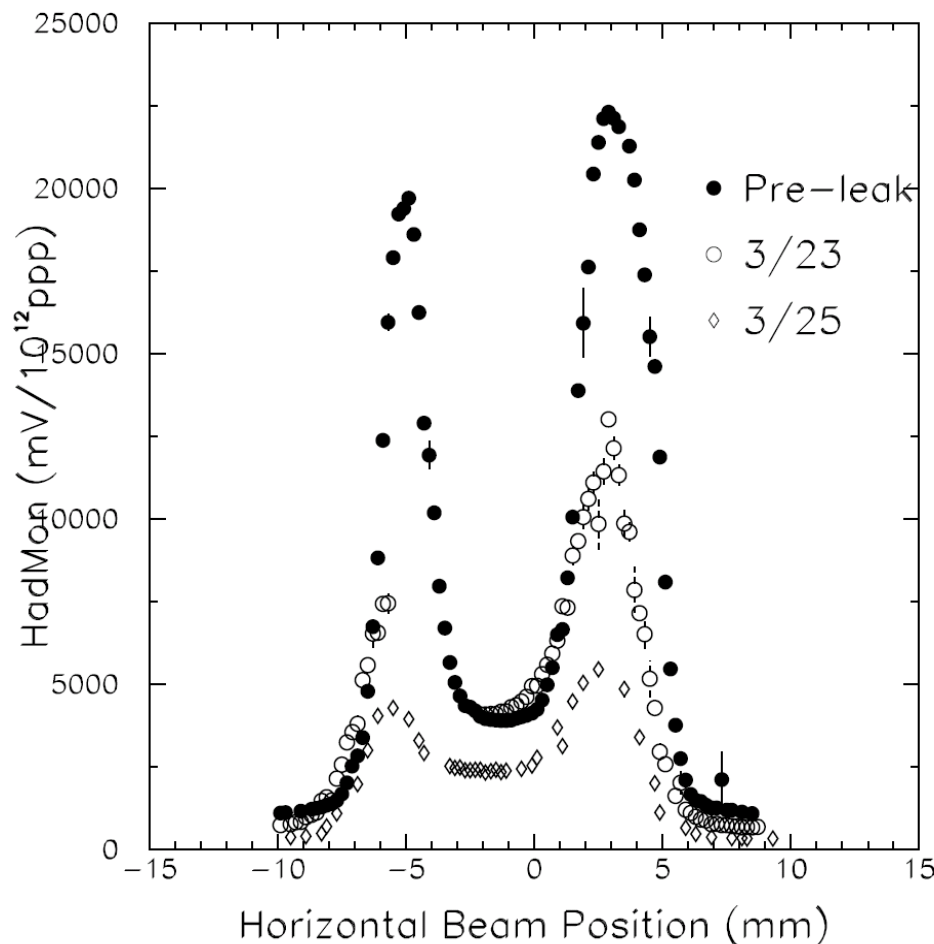


MINOS

# All Experimenter's Meeting

## NuMI Target Situation/Status(5)

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 5



This plot shows the results of Horizontal Scans across the target. Transmission to the Hadron Monitor just before the absorber is plotted. On the left the beam is completely absorbed by the baffle. Then the beam crosses the vacuum space between the target and baffle, maximizing transmission, and then hits the target, and repeats in reverse to the right.

Note that transmission falls in successive scans as the target fills with water.

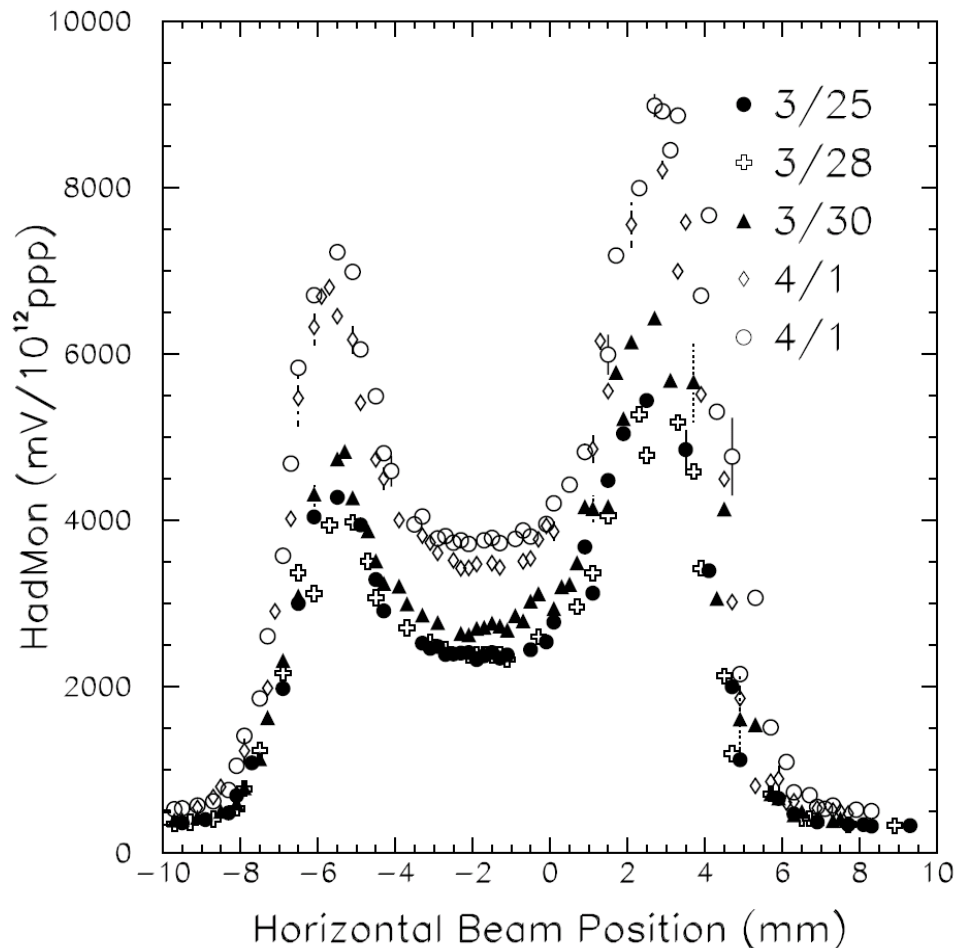


MINOS

# All Experimenter's Meeting

## NuMI Target Situation/Status(6)

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 6



This plot shows the results of more Horizontal Scans across the target. Transmission to the Hadron Monitor just before the absorber is plotted.

Note that transmission rises in successive scans as some of the water is pushed out of the hole by over-pressurizing the vacuum space with Helium.

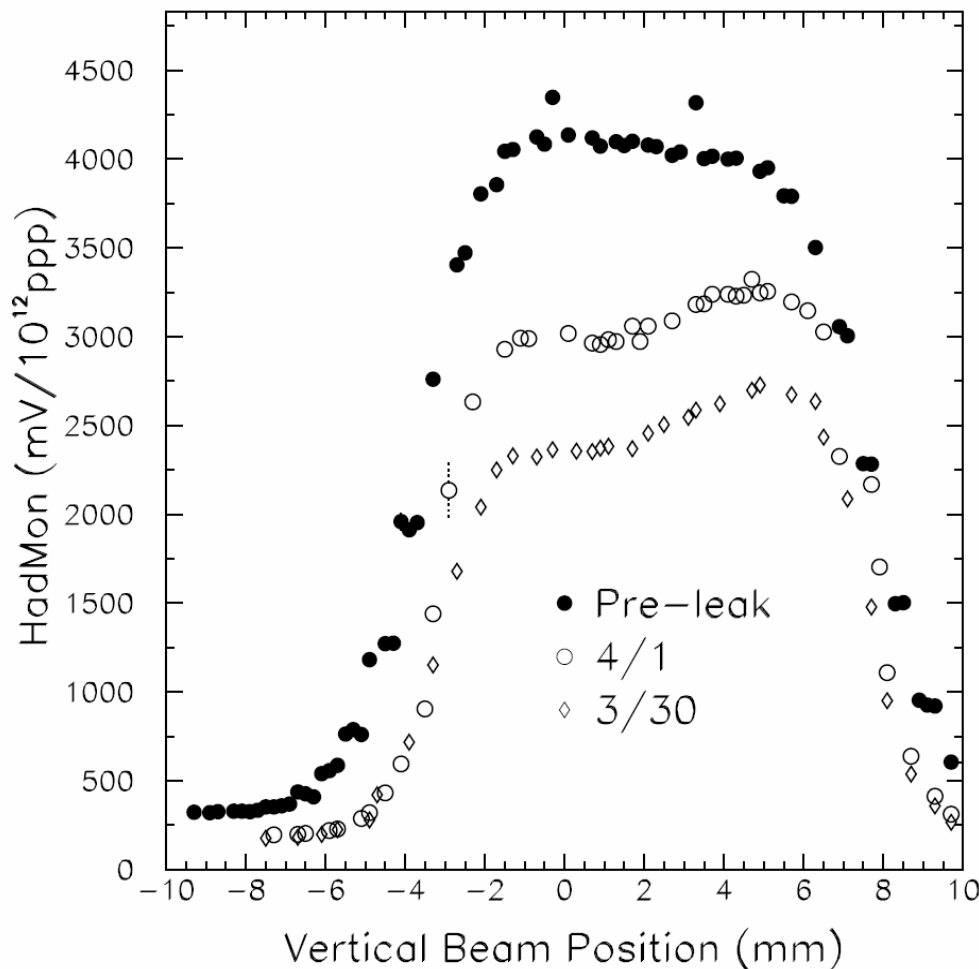


MINOS

# All Experimenter's Meeting

## NuMI Target Situation/Status(7)

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 7



This plot shows the results Of Vertical Scan across the target. Transmission to the Hadron Monitor just before the absorber is plotted.

Note that transmission rises in successive scans as some of the water is pushed out of the hole by over-pressurizing the vacuum space with Helium.

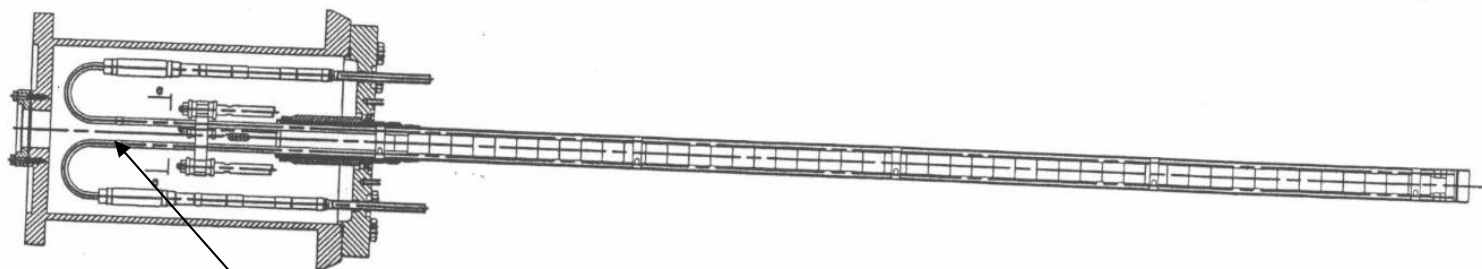


MINOS

# All Experimenter's Meeting NuMI Target Situation/Status(8)

All Experimenter's Meeting  
April 4, 2005  
NuMI Target Situation  
D. Bogert  
Page 8

## THE NuMI TARGET



Leak thought to be here.